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The Mineral Waters of Indiana

WITH INDICATIONS FOR THEIR THERAPEUTIC APPLICATION.

By ROBERT HESSLER, A. M., M. D.
LOGANSPORT, IND.

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THE MINERAL WATERS OF INDIANA, WITH INDICATIONS FOR THEIR APPLICATION.

BY ROBERT HESSLER, A. M., M. D., OF LOGANSPORT.

The writer recently had an opportunity of going over a collection of analytical tables of Indiana mineral waters, through the kindness of Mr. W. S. Blatchley, the State Geologist, and a study of these tables led him to certain conclusions, which are here briefly outlined. It may be said that, as generally used, the term mineral water is an elastic one and includes both feebly and highly mineralized waters. In the circulars of some owners of springs and wells, the term is applied on the one hand to waters which are very pure—that is, are only slightly mineralized—and, on the other, to waters containing up to ten thousand grains of solids per gallon, all sorts of claims, of course, being made for the curative properties of such waters.

As used by the physician, the term mineral water is applied to any water which contains sufficient mineral matter to produce noticeable effects and used in the treatment of disease.

The array of chemical names and of figures, often carried to the third decimal point in these advertising circulars, is mystifying and confusing to the uninitiated, and the layman often applies to the physician for enlightenment and advice in regard to the suitability of certain waters as a means of obtaining relief from affliction.

The importance of water—of pure water—to the welfare of the human body is not fully appreciated by many. Water is one of the essentials of life, and we take it either in the form of drinking water or in the form of soup, coffee, tea or other drink, and to a large extent in succulent vegetables and fruits.

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Mineral waters, on the other hand, are not essential to the body in health, but may be of service in disease or disturbed functioning of the organs. As a rule, they do not add to the nutrition of the body, but, on the contrary, they take away, they deplete. Chalybeates, or iron waters, are, of course, an exception. It is self-evident that the nature of the pathological process should be understood and its extent in the body known before any scientific use can be made of a mineral water whose constituents and therapeutic actions or properties are known. Without such a dual knowledge, the whole matter becomes empiricism—a water may do good, it may have no influence at all, or it may do harm. The blind and indiscriminate use by the laity of mineral waters, especially of those highly mineralized, should be discouraged. No strong waters should be used unless on the advice of a physician after a study of the case or conditions.

In the following table the mineral waters of the State, those which have been analyzed quantitatively according to Mr. Blatchley's report,* are arranged in serial order according to the amounts of solid matter in grains per gallon. (The amounts of chlorides and sulphates were shown in color, in the original diagram.)

This table shows at a glance the position of any water—that is, its contents in solids. At one end of the series are the pure water springs, with mere traces of mineral matter; at the other the waters of the deep wells, highly mineralized.

A little study will show that these waters may be divided into groups, according to the amount and kind of mineral matter and also according to the geological formation from which they come. A mineral water is said to be an index of the character of the geological strata with which the water has come in contact.

There are a few aberrant waters which may be placed under more than one group; the Columbus deep well, for instance, has

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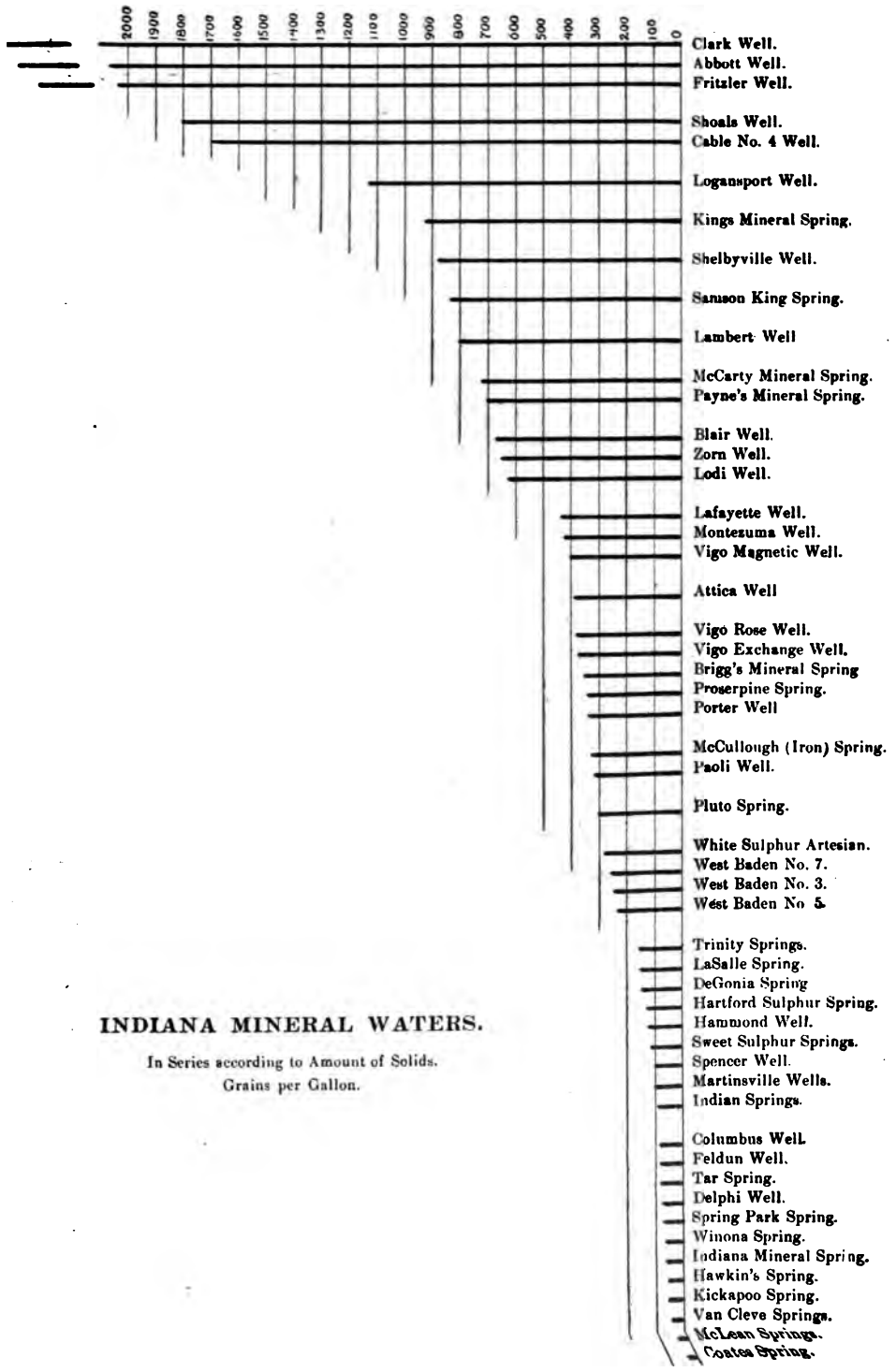
* The following table contains all the waters for which the writer has been able to obtain quantitative figures. That institutions or health resorts making use of waters which have not been thus quantitatively analyzed are at a great disadvantage is self-evident, and how such waters can be satisfactorily applied is an enigma. Waters which are essentially pure waters can hardly be called "mineral waters," else all of our spring and well waters could also be called mineral waters, as all contain more or less mineral matter, those of the limestone and drift-covered regions being saturated with calcium carbonate.



INDIANA MINERAL WATERS.

In Series according to Amount of Solids.
Grains per Gallon.

a water similar to those of Martinsville and Spencer, but has, in addition, a small amount of sulphates. Distinctions may also be made according to the amounts of alkalies present. Many contain sufficient carbonate, chiefly of calcium, to render the water alkaline, and such waters may appropriately be called alkaline-saline. Whether, in a brief paper such as this, any special grouping should be made of waters containing other ingredients, such as iodides, bromides or even of lithium, is an open question. The writer believes not, for the reason that the amounts of chloride of sodium, and of magnesium and sodium sulphate, in the water determines its general action, or, rather, the reaction of the body on taking the water. The action of minor ingredients, present in relatively small amounts, are wholly overshadowed by the action of the common ingredients, the chlorides and sulphates. It would certainly be unreasonable to expect any decided effect from, say, twenty grains of lithium in a gallon of water which contains, says, a thousand grains of common salt. A tumblerful of such a strong brine would be a most disagreeable dose, which few could care to take for the trace of lithium. The same may be said of waters containing bromides, even when present in considerable amount, as in the water of the Shoals well, for the amount of chlorides and sulphates wholly overshadows any beneficial effects that might be produced. If these rare ingredients were the only substances present, then such waters would be invaluable in certain affections, because they could be used freely and in sufficient quantity.

CHIEF AND IMPORTANT SALTS OF INDIANA MINERAL WATERS.

Chlorides.—Chlorine is almost universally present in our waters, from mere traces in waters of the springs belonging to the pure water series, up to immense amounts in those of the deep wells. Its usual combination is with sodium as sodium chloride, or common salt; more rarely with magnesium, calcium, potassium, or some of the less common elements. Chlorides, particularly that of sodium, are decomposed in the stomach by the action of the hydrochloric acid cells, the free acid liberated taking part in the process of digestion. Sodium chloride is one of the essential salts re-

quired by the body in maintaining health; it regulates absorption, nutrition and secretion, and is, in fact, of the utmost importance in these vital processes. A sufficiency for life is supplied in our daily food. Additional quantities may be beneficial in cases of deficient gastric acidity, while, on the other hand, in hyperacidity an excess may be injurious. Sodium chloride in sufficiently large doses acts as an aperient, larger doses are emetic and purgative; whether it increases tissue metabolism is doubtful.

Sulphates.—The sulphuric acid in our Indiana mineral waters is combined mainly with magnesium, as Epsom salt; more rarely with sodium, as Glauber's salt. Combined with calcium, as calcium sulphate, it is widely diffused, but since this salt is only slightly soluble, it plays no important part. In a general way it may be said that the sulphates—of magnesium and sodium—act on the intestinal canal, and if given in large doses they are decidedly purgative. The amount of sulphates in a water determines its value as an aperient, laxative or purgative. That a small amount of a purgative water may act as an aperient is self-evident.

Carbonates.—Little need be said under this head. We all know that the carbonates, of calcium, magnesium, sodium and potassium, are alkaline and neutralize acids and that they are used in acid conditions—in hyperacidity of the stomach, of the urine, or of the blood. Our most common carbonate is that of calcium; nearly all the waters of our wells and springs, certainly those of the limestone regions and glacial drift areas, are saturated with it, in the form of the bicarbonate. To a person coming from a freestone region such waters have distinctly antacid and diuretic properties.

Bases.—Of bases, it may be said that our common ones, as already mentioned, are those of calcium, magnesium and sodium, and that their action on the body is dependent on their combination with the above acid radicals. Other bases are found in such small amounts, or their possible action is so overshadowed by those of the common constituents, that they need not be mentioned at all.

In the light of the above, our waters may be grouped, as shown by the table at the end of this paper.

GROUPING OF INDIANA WATERS.

Nearly all of our waters fall naturally into certain groups or types, determined by the amounts and kinds of solids and by their geological derivation.

Group No. 1.—This comprises springs of a superficial origin, with water only slightly mineralized. They may be used where a pure water is indicated.

Group No. 2.—This group comprises a well-defined series of wells, the source of whose waters is in the Niagara limestone. They contain comparatively small amounts of solids, principally sodium chloride. The absence of sulphates is characteristic of this group.

Group No. 3.—Is composed of springs whose origin is in the conglomerate sandstone; those of Pike county, coming from a greater depth, being warmer. The solids are mainly sulphates, with comparatively small amounts of chlorides. On account of the composition of its water the Hammond well may be placed in this group.

Group No. 4.—The springs of this group issue from the juncture of the Chester sandstone with the underlying limestone, the wells, as that of Paoli, evidently obtaining their water from the same source. They contain less solids than the next group, but relatively more chlorides.

Group No. 5.—Are waters springing from the New Providence shales and characterized by large quantities of solids, mainly sulphates, with more or less chlorides.

Group No. 6.—Chalybeates, or iron, waters. Such waters are common throughout the State. A few springs and wells have been analyzed quantitatively.

Group No. 7.—This group includes most of our deep wells in different parts of the State, and is characterized by the presence of large quantities of common salt, accompanied by greater or less quantities of other solids. They are essentially brines, the Clark well, in Rush county, containing about 7,000 grains of chlorides per gallon.

In regard to the action of the waters under the above heads, it may be said that where free purgation is required, those of the New

Providence shale group are especially indicated; for more gentle effects, one of the Chester-Mansfield group may be desirable; while if a very mild action is desired, and where a condition of hyperacidity exists, as of the stomach, the waters of the conglomerate-sandstone type or group may be best suited; in conditions with diminished acidity, and where a mild saline is indicated, one of the Niagara group waters may be of service.

Where the free use of water is indicated, one of the pure water springs may be used. Anemic patients may require the use of some good iron or chalybeate water. Waters of this kind abound in almost every county; they may be known by the yellow or oily ooze deposited about the springs.

Of the salt waters, or brines, of our deep wells, it may be said that they are good for bathing purposes. On account of their density they promote osmosis and will, no doubt, be found serviceable in certain affections. The warm, deep wells of Terre Haute, with a temperature of 80 degrees, deserve especial mention.

Many of our springs and wells contain more or less sulphuretted hydrogen gas, known by its pungent odor, but whether this plays any part as a curative agent seems doubtful. At best the amount of such gas taken in a glass of water is small and no marked results are to be expected from it. When the water containing the gas is heated, or stands for any length of time, the gas is given off, leaving only the solid mineral matter in solution.

If the writer were inclined to recommend for general use any one class of springs, or wells, it would be that of the pure water group. Pure water can do no harm and may do much good. Waters highly mineralized should be used cautiously; if they are able to produce good results in properly selected cases, which no one denies, they may also be harmful in unsuitable cases, as any remedy improperly given may do harm.

In case of doubt as to where to send a patient, no harm can result from sending him or her to a pure water, or slightly mineralized, spring, with pleasant and cheerful surroundings and facilities for whiling away the time.

The owners of some of our Indiana mineral water resorts have

shown commendable enterprise in the erection of suitable buildings of various kinds for the accommodation of the public, and for this reason, in many diseases and affections, there is no longer any need of sending patients out of the State.

SENDING PATIENTS TO A MINERAL WATER RESORT.

Among the factors or elements that require special consideration in deciding where to send a patient, are the following:

1. The condition or constitution of the invalid or patient. His condition should be one where the use of a mineral water is indicated, and he should be able to bear the journey.

2. The character of the mineral water must be considered. What it will not do must be considered as well as what it may do for the invalid.

3. The medical supervision at the springs.

4. The daily life at the springs. The question how the time is to be spent at the resort must be considered the recreation, amusement, how to while away the time, etc. Many persons away from home, with nothing to do, tire very readily.

5. The climatic influence. The season of the year, whether warm or cold, and the amount of sunshine or rain, have a marked influence in many cases, and an otherwise suitable water should not be condemned on account of the modifying weather conditions. A water that may be found beneficial in the summer, with an outdoor life, may be held to be of no use in the winter, with a life confined to close and overheated rooms. The water itself should not be condemned on this account.

6. The matter of expense and the relative probable good results should be considered.

7. The probable duration of the stay at a resort must be considered before going, and how long to remain determined after having been at the spring for some time.

Our mineral water health resorts are still in their infancy. Judging by the experience of European countries, Indiana's mineral water health resorts are destined to occupy an important place in the future.

INDIANA MINERAL WATERS.

A list of the waters, which have been analyzed quantitatively, according to the State Geologist, is here presented:

PURE WATERS, OR ONLY SLIGHTLY MINERALIZED.

Coates Spring, Pike County.
McLean Springs, Putnam County.
Van Cleaves Springs, Montgomery County.
Kickapoo Spring, Warren County.
Hawkins Spring, Wayne County.
Indiana Mineral Spring, Warren County.
Winona Spring, Kosciusko County.

SALINES, MILD. NIAGARA LIMESTONE TYPE.

Delphi Artesian Well, Carroll County.
Martinsville Wells, Morgan County.
Spencer Artesian Well, Owen County.
Columbus Well (slightly sulphated), Bartholomew County.

ALKALINE-SALINES, MILD, SULPHATED. CONGLOMERATE SANDSTONE TYPE

Indian Springs, Martin County.
Sweet Sulphur Springs, Pike County.
Hammond Artesian Wells, Lake County.
DeGonia Springs, Crawford County.
LaSalle Spring, Martin County.
Trinity Springs, Martin County.

SALINES, SULPHATED. CHESTER-MANSFIELD TYPE.

Hartford Sulphur Well, Crawford County.
West Baden Springs, Orange County.
White Sulphur Artesian, Crawford County.
Pluto Spring, Orange County.
Paoli Artesian Well, Orange County.
Proserpine Spring, Orange County.

SALINES, SULPHATED. PURGATIVE. NEW PROVIDENCE SHALE TYPE.

Brigg's Mineral Spring, Floyd County.
McCarty Mineral Spring, Brown County.
Payne's Mineral Spring, Clark County.
Samson King Mineral Spring, Clark County.
Kings Mineral Spring, Clark County.

CHALYBEATES. IRON WATERS. SPRINGS AND WELLS.

Spring Lake Park Spring, Hancock County.
Feldun Well No. 5, Lawrence County.
McCullough Spring, Gibson County.

SALINES, STRONG. BRINES, WITH RELATIVELY LITTLE SULPHATE.

Porter Artesian Well, Porter County.
Vigo Thermal Wells, Vigo County.
Attica Artesian Well, Fountain County.
Montezuma Artesian Well, Parke County.
Lafayette Artesian Well, Tippecanoe County.
Lodi Artesian Well, Fountain County.
Zorn Artesian Well, Laporte County.
Blair Artesian Well, Laporte County.
Lambert Mineral Well, Elkhart County.
Shelbyville Mineral Well, Shelby County.
Logansport Well (West Side), Cass County.
Cable No. 4 Well, Daviess County.
Shoals Artesian Well, Martin County.
Fritzler Well, Vanderburg County.
Abbott Mineral Well, Allen County.
Clark Artesian Well, Rush County.

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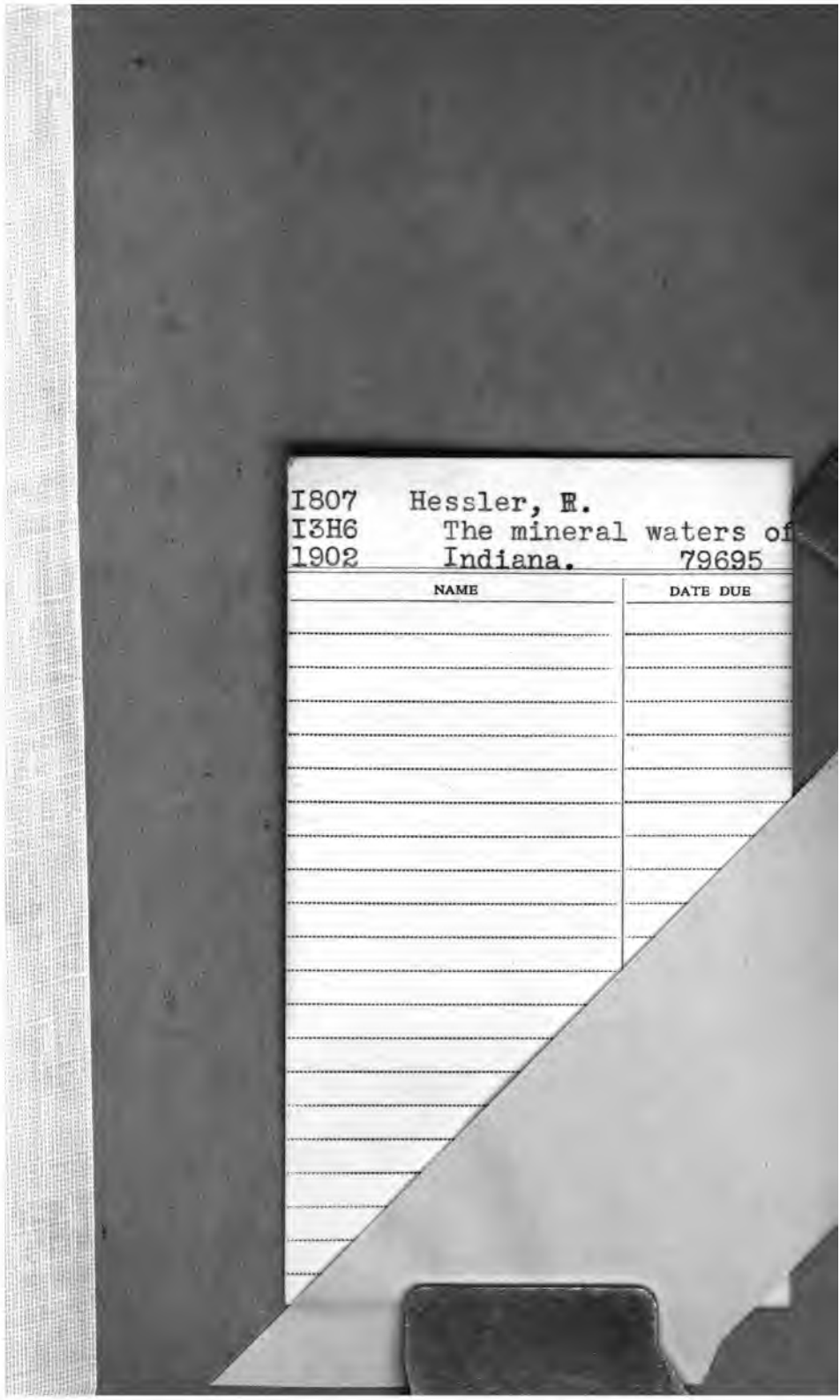
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